Saskatchewan
Agriculture
and Food

SUSTAINABLE PRODUCTION BRANCH

1999 SPECIAL CROPS PROCESSORS SURVEY

FINAL REPORT

Survey Conducted by

SAMPLE SURVEY UNIT

STATISTICS BRANCH

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EXECUTIVE SUMMARY

The goals of the 1999 Special Crops Processors Survey are to gather data that will assist industry stakeholders in assessing the scope and nature of the special crops processing sector, and to provide primary producers with information about processors and the services they offer.

The picture emerging from the survey is one of advancing commercialization of the sector as special crops production increases and marketing patterns change. Considerable recent growth in business output has been accompanied by modest consolidation within the sector. Processing firms are becoming well-established commercial operations with on-going, non-seasonal employment patterns. The sector has established a significant level of job creation and contributes substantially to economic activity in rural Saskatchewan.

NUMBER OF PROCESSORS

- There are an estimated 128 special crops processors in Saskatchewan, a 10% decline in number since 1995.

FULL-TIME EMPLOYMENT EQUIVALENTS

- There are an estimated 846 full-time equivalents (person years) of employment in the special crops sector.
- The average number of full-time equivalents is 6.7 per processor.
- Total annual payroll for the sector is estimated at $21 million.

NUMBER OF EMPLOYEES

- There are an estimated 1,086 employees in the sector, up 6% from 1995.
- The average number of employees per processor is 8.6, up from 7.2 in 1995.
- Employment is concentrated (64% of all employees) in the year-round, full-time category.
- Only 10% of processors have no year-round, full-time employees.
- Less than 2% of processors have no employees at all.
- Half (51%) of all processors plan to expand within three years and 30% plan to expand within one year.

CROPS PROCESSED

- The special crops most commonly processed are peas (86% of processors) and lentils (75% of processors).
- Canaryseed is the third (53% of processors) and chickpea the fourth (40% of processors) most common.
- The percentage of firms processing a particular crop has increased for all crops since 1995 but has increased dramatically for chickpeas (by 2748%), for organic grains (by 1112%), and for triticale (21% vs. 0%).

VALUE-ADDED ACTIVITIES

- The total volume of all processing activities is estimated at 3.55 million tonnes.
- Cleaning, bulk loading, and bagging account for nearly all processing (97%).
- Secondary processing activities such as seed splitting, colour sorting, and feed processing are concentrated among relatively few processors.
- While the average cleaning plant capacity is 6.7 tonnes per hour, the median capacity is 4.5 tonnes per hour. The majority (54% of processors) has a capacity between two and five tonnes per hour.
- Nearly half of processors (47%) purchase special crops.
- Nearly half of processors (48%) export special crops.

TABLE OF CONTENTS

Executive Summary i

1. Background 1

2. Purpose 1

3. Methodology 2

4. Survey Topics 2

5. Survey Results 3

5.1 Section A: Survey Population 3

5.2 Section B: Crops Processed 3

5.2.1 Most Commonly Processed Crops 3
5.2.2 Changes Since 1995 3

5.3 Section C: Economic Impact 5

5.3.1 Employee Full-time Equivalents 5
5.3.2 Number of Employees 6
5.3.3 Expansion Plans 7

5.4 Section D: Value-added Activities 8

5.4.1 Types of Processing and Volumes 8
5.4.2 Cleaning Capacity 9
5.4.3 Special Crops Marketing 9

5.5 Geographical Distribution 9

TABLES AND CHARTS

FIGURE 1: Disposition of Survey Population 3
FIGURE 2: Distribution of Processors by Crops Processed and Comparison to 1995 4
FIGURE 3: Comparison of Crops Processed – 1995 to 1999 4
FIGURE 4: Distribution of Processors by Employee Full-time Equivalents 5
FIGURE 5: Estimated Total Number of Employees and Average per Processor 6
FIGURE 6: Distribution of Processors by Number of Employees 6
FIGURE 7: Distribution of Processors by Number of Employees and Employment Period 7
FIGURE 8: Processor Expansion Plans 7
FIGURE 9: Value-added Activities and Volumes 8
FIGURE 10: Processors' Cleaning Capacity 9
FIGURE 11: Geographical Distribution of Special Crops Processors 10

1. BACKGROUND

In the past two decades the pattern of production and marketing of field crops in Saskatchewan has undergone significant change in response to economic forces at both the domestic and international level. International subsidization of the traditional range of Saskatchewan grain crops, elimination of transportation supports for exports, and more intensified land use for crop production are among the factors leading to a rise in production of special crops in general, particularly pulses and, more recently, herbs and spices.

The increase in production of special crops in Saskatchewan has been dramatic. For example, recent reports from Sask. Agriculture & Food indicate that:

- Production of special crops reached a record 2.6 million tonnes in 1998, up from less than 0.3 million tonnes in 1982.
- The area seeded to special crops in 1998 was a record 4.0 million acres, up from about 0.4 million acres in 1982.
- Two pulse crops – lentils and peas – accounted for only about 0.1 million acres in 1982 compared to 2.8 million acres in 1998.
- The number of special crop producers in the province increased from fewer than 4,000 in 1982 to more than 17,000 in 1998.

In turning to production of special crops, producers have primarily searched for higher value crops to enhance their business margins. They have also looked for new crops to capture marketing opportunities and for diversification of their crop base to stabilize returns and facilitate complex crop rotations.

Along with these trends, value-added processing has been the recent focus of domestic agricultural policy and of business development strategies for processing firms that are servicing the processing and marketing needs of special crops growers. The special crops processing sector is emerging as a substantial component of value-added economic activity in rural Saskatchewan, with a demonstrated job creation capacity.

As a result, information related to services provided by processors, and to the impact of their business on the economy of rural Saskatchewan, is of vital importance to all stakeholders in the special crops sector. By informing policy and business decisions, such data will enhance service provision and advance prospects for sector diversification and growth. Gathering this data and distributing the information has been undertaken by the Sustainable Production Branch of Sask. Agriculture & Food, which conducted an initial survey of processors in 1995 prior to the current one.

2. PURPOSE

The purposes of the 1999 survey of special crops processors are three-fold:

1. To provide policy makers with a picture of the industry, especially its economic impact on rural Saskatchewan.
2. To provide the industry with information about the scope and characteristics of special crops processors.
3. To provide primary producers with information about the services offered by processors and where to access them.

3. METHODOLOGY

All known special crops processors were surveyed. Sustainable Production Branch supplemented its existing list of processors by surveying Sask. Agriculture & Food Extension Agrologists for recently established enterprises. Since the survey amounts to a census of special crops processors, the results should be considered representative of the sector.

The survey utilized a combination of mail-back and computer-assisted telephone interviews (CATI). The survey instrument was mailed to processors in early March, with data reduction and entering conducted as they were returned. Experienced interviewers began telephoning of processors who had not mailed back questionnaires in early April, with call-backs for data clarification completed in early May.

The data were analyzed using SPSS and Excel computer software.

4. SURVEY TOPICS

The survey instrument was relatively brief.

Section A gathered the names, mailing addresses, telephone numbers, and electronic addresses of processing firms. This information is essential to facilitate Sustainable Production Branch's communication with processors and to compile a processor contact list that can be distributed to Saskatchewan producers.

Section B yielded a profile of the special crops that are being processed by each firm, information vital to both the Branch's database and the processor contact list. Processors were asked if they processed the following crops:

- Lentils
- Peas
- Chickpeas
- Marrow Fat Pea
- Canaryseed
- Mustard
- Dry Beans
- Coriander
- Caraway
- Dill
- Borage
- Buckwheat
- Sunflower
- Safflower
- Triticale
- Forage Seed
- Organic Grains
- Quinoa

Section C dealt with employment and expansion plans. Processors reported the number of employees they have in four categories: 1) year-round, full-time; 2) year-round, part-time; 3) seasonal, full-time; and 4) seasonal, part-time. They also indicated if they planned to expand within 1 year, expand within 3 years, or that they had no expansion plans.

Section D investigated processors' value-added activities. They reported the volumes of special crops they process in the following categories:

- Cleaning
- Bagging
- Bulk Loading
- Retail Packaging
- Colour Sorting
- Splitting
- Milling
- Feed Processing
- Other

Processors also indicated the capacity (tonnes per hour) of their seed cleaning plants and reported whether they purchase special crops and whether they export special crops.

5. SURVEY RESULTS

5.1 SECTION A: Survey Population

A total of 166 processors were identified, of which a total of **128** can be considered current special crops processors. Since the previous (1995) survey of processors identified 143 firms that were processing special crops, there has been a 10% decline in the number of active processors since 1995. Figure 1 shows the disposition of the survey population according to the results of the calls.

FIGURE 1: Disposition of Survey Population

Call Result	Number	Percent
Processing	118	71.1%
Not processing	29	17.5%
Out of business	6	3.6%
Cannot contact	3	1.8%
Getting started	2	1.2%
Refusal	8	4.8%
Total	166	100.0%

5.2 SECTION B: Crops Processed

5.2.1 Most Commonly Processed Crops

- The special crops most commonly processed are the major pulse crops – **peas** (86% of processors) and **lentils** (75% of processors).
- The only other special crop processed by more than half of processors is canaryseed (53%).
- The position of chickpeas as the fourth most commonly processed special crop is a function of the importance of sizing chickpea seed for the human consumption market and a reflection of its growing popularity among producers as a high value crop.

5.2.2 Changes Since 1995

- The percentage of firms processing a particular special crop has increased for **all** crops since 1995[1], demonstrating that processors are diversifying the range of crops they process. This increase is partly a reflection of the increased production of special crops generally[2] and, considering the (10%) decline in the number of processor since 1995, reveals that growth in the output of individual firms is occurring in addition to the diversification of crops processed.
- Among the 21% of the firms surveyed that are either no longer in business or not handling special crops, it is likely that smaller processors, particularly of lentils and peas, have ceased processing.
- Chickpeas have shown the most dramatic increase in the percentage of firms that process them – 40% of all processors compared to 1.4% in 1995, an increase of 2748%.
- Only 1.4% of firms processed organic grains in 1995, compared to 16.9% in 1999 – up 1112%.
- No triticale processing was reported in 1995, but 21% of firms processed triticale in 1999.

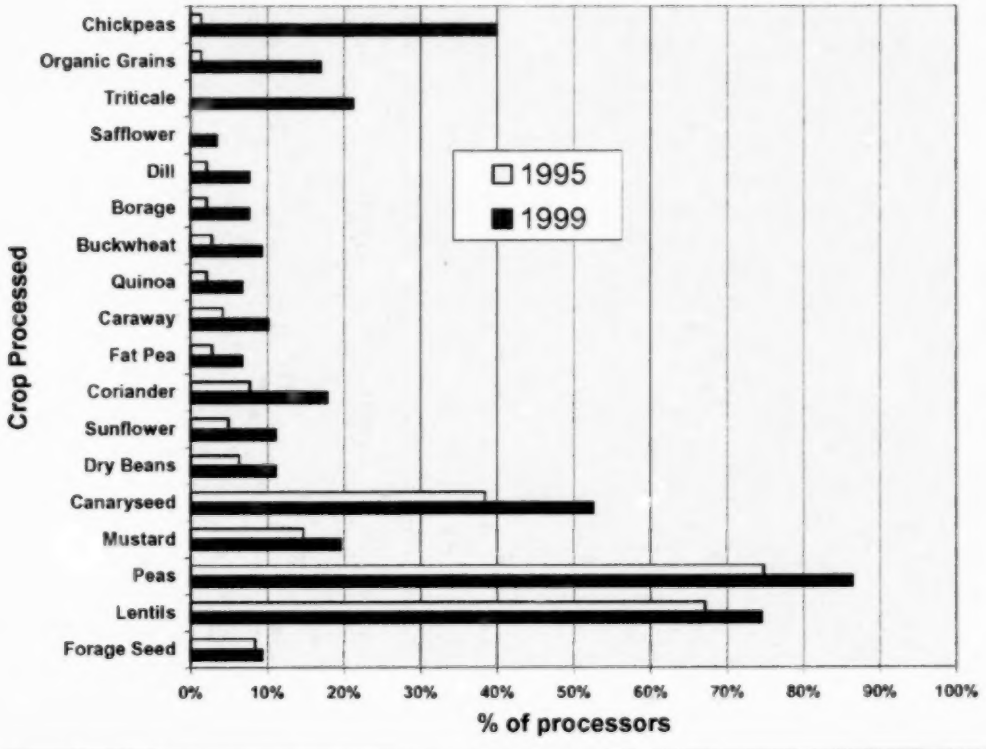
Figure 2 ranks special crops by the percentage of processors processing the crop and compares this prevalence to the sector pattern in 1995. Figure 3 highlights graphically the changes since 1995.

[1] Due to the uncertainty from several refusals, the **actual numbers** processing lentils, peas and forage may have declined slightly since 1995. It is known that the numbers processing all other crops have increased. **Percentage** of processors is used as a measure since it allows direct comparison between the data in both 1999 and 1995 surveys.
[2] Special crop production rose 56% from 1995 to 1998 (Sask. Agriculture & Food, *1998 Specialty Crop Report*).

FIGURE 2: Distribution of Processors by Crops Processed and Comparison to 1995

	% of processors		% increase in prevalence
Crop processed	**1999**	**1995**	of crop being processed
Peas	86.4%	74.8%	15.5%
Lentils	74.6%	67.1%	11.1%
Canaryseed	52.5%	38.5%	36.6%
Chickpeas	39.8%	1.4%	2747.9%
Triticale	21.2%	0.0%	
Mustard	19.5%	14.7%	32.7%
Coriander	17.8%	7.7%	131.4%
Organic Grains	16.9%	1.4%	1111.9%
Dry Beans	11.0%	6.3%	75.0%
Sunflower	11.0%	4.9%	125.1%
Caraway	10.2%	4.2%	142.4%
Buckwheat	9.3%	8.4%	233.3%
Forage Seed	9.3%	2.8%	11.1%
Dill	7.6%	2.1%	263.6%
Borage	7.6%	2.1%	263.6%
Marrow Fat Pea	6.8%	2.8%	142.4%
Quinoa	6.8%	2.1%	223.2%
Safflower	3.4%	0.0%	

FIGURE 3: Comparison of Crops Processed – 1995 to 1999



5.3 SECTION C: Economic Impact

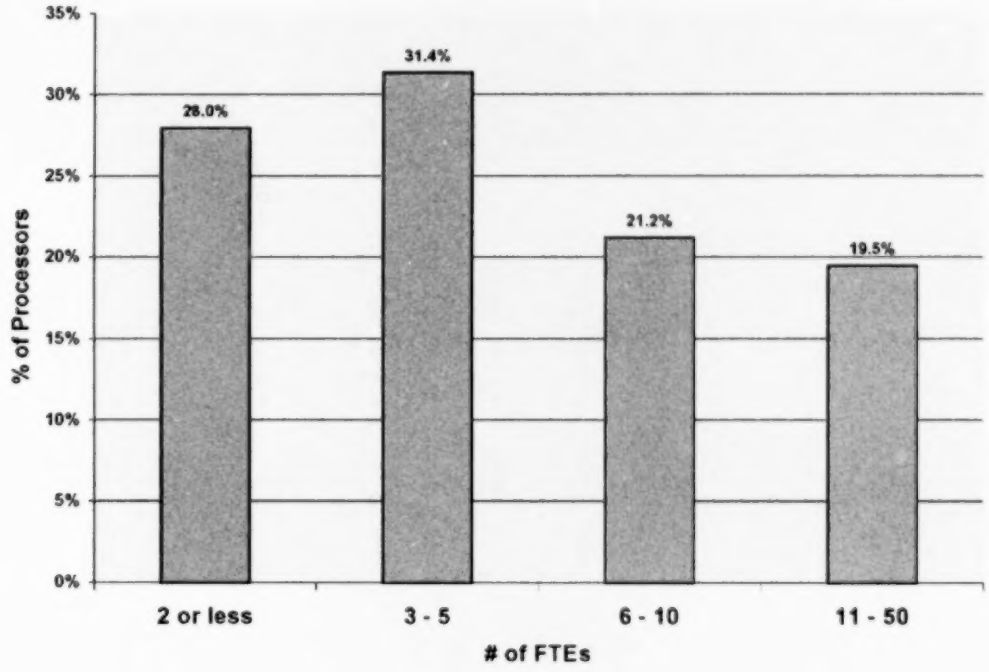
5.3.1 Employee Full-time Equivalents (FTEs)

The numbers of employees reported by processors were converted into weighted estimates of full-time equivalents (or person-years) of employment by weighting the employment period categories as follows:

Year-round, full-time ..... 1.00 FTE
Year-round, part-time..... 0.50 FTE
Seasonal, full-time..... 0.50 FTE
Seasonal, part-time..... 0.25 FTE

Using this method, the estimated total number of employment full-time equivalents in the sector is **846.2.**[3] The average number of FTEs per processor is **6.7** and the maximum number reported is 50. Total annual payroll for the sector is estimated at **$21 million** by applying an average wage rate of $12 per hour.[4] The distribution of processors by number of FTEs is shown in Figure 4.

FIGURE 4: Distribution of Processors by Employee Full-time Equivalents



[3] Refusals, but not those getting started, are included in economic estimates by imputing averages to these processors.
[4] The survey did not ask for actual payroll amounts from processors. In the absence of detailed information about the distribution of job types (i.e. labourer, machine operator, manager, etc.) only a general estimate of the annual wages/salaries of employees is possible. Extrapolating from historic data (Sask. Ag & Food, *StatFacts #13.06, 1998.05.12*), the average agricultural wage rate is estimated at $10.21 per hour. Since more than 60% of employees are year-round, full-time, it is very likely that average wage rates for processors' employees would exceed the agricultural labour rate and, thus, $12 per hour is used. Also, if the processing sector pays higher rates than farm labour rates, then the annual payroll of the sector might exceed the estimated $21 million. On the other hand, the method of converting numbers of employees to FTEs may have slightly over-estimated the number of FTEs.

5.3.2 Number of Employees

Despite a (10%) decline in the number of processors, the number of employees has increased nearly 6% since 1995. Thus, the average number of employees per processor has increased significantly (18%) since 1995.

- The estimated total number of employees in the sector is **1,086** compared to the 1,027 estimated by the 1995 survey.
- The average number of employees per processor is estimated at **8.6**, compared to 7.2 in 1995.

The overall employment pattern characterizes the sector as having well-established firms with on-going, non-seasonal marketing patterns:

- Employment is concentrated in the year-round, full-time category – 64% of all employees (Figure 5).
- A mirrored reflection of this concentration occurs in the distribution of processors by number of employees, where only one firm in ten (10%) has **no** year-round, full-time employees (Figure 7).
- While the largest category (29%) of firms has more than ten employees, fewer than 1 in 50 processors (1.7%) has no employees at all (Figure 6).

FIGURE 5: Estimated Total Number of Employees and Average per Processor

Employment period	Total # employees	% of all employees	Average # employees
Year-round, full-time	690	63.5%	5.5
Year-round, part-time	149	13.8%	1.2
Seasonal, full-time	80	7.4%	0.6
Seasonal, part-time	167	15.3%	1.3
Overall	**1,086**	100.0%	**8.6**

FIGURE 6: Distribution of Processors by Number of Employees

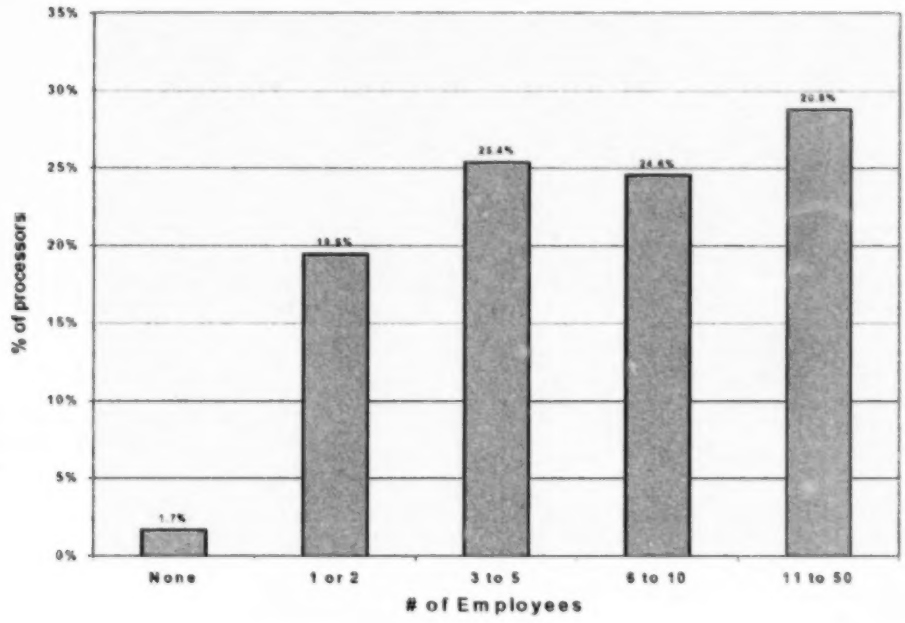


FIGURE 7: Distribution of Processors by Number of Employees and Employment Period

	% of processors			
Employees per firm	Yearly/full-time	Yearly/part-time	Seasonal, full-time	Seasonal, part-time
None	10.2%	60.2%	77.1%	55.9%
1 or 2	30.5%	23.7%	15.3%	27.1%
3 to 5	27.1%	10.2%	6.8%	11.9%
6 to 10	19.5%	5.9%	0.0%	4.2%
11 to 50	12.7%	0.0%	0.8%	0.8%
Total	100.0%	100.0%	100.0%	100.0%

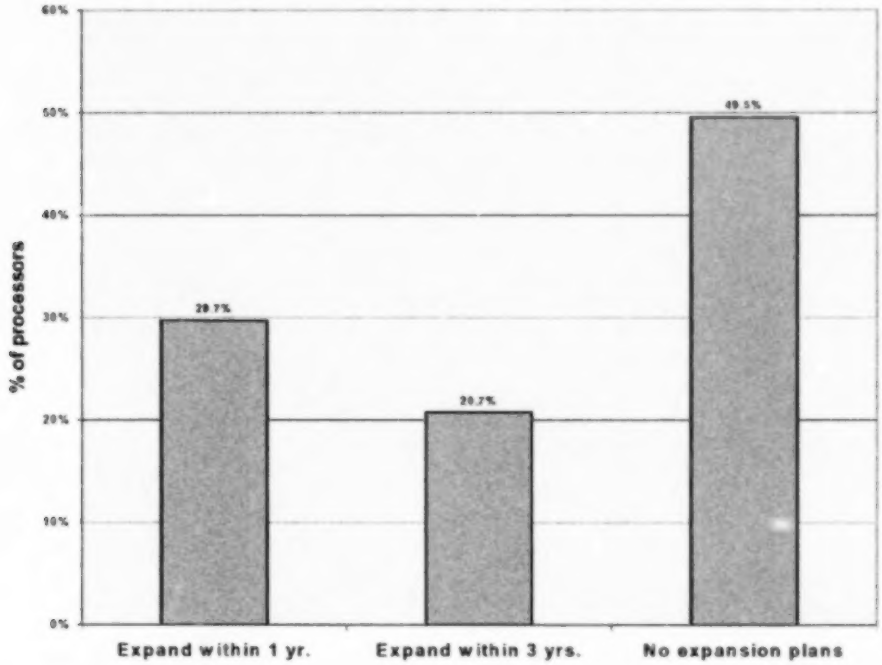
5.3.3 Expansion Plans

Fully half (51%) of all processors plan to expand within three years and three out of ten (30%) plan to expand within one year. Thus, among those with expansion plans, the majority (59%) plans to expand immediately.

These business intentions are quite bullish, especially in light of currently low commodity prices, including those of special crops. These expansion plans seem to be consistent with evidence elsewhere in the survey showing simultaneous expansion of output and consolidation of the number of processors.

Processors' expansion plans are summarized in Figure 8.

FIGURE 8: Processor Expansion Plans



5.4 SECTION D: Value-added Activities

5.4.1 Types of Processing and Volumes

The total volume of value-added processing in the sector is estimated to be **3.55 million tonnes**. (Note that most of the cleaning volume is counted again as bulk loading or bagging.)

The primary value-added activities in the sector continue to be cleaning, bulk loading, and bagging. These three processes account for nearly all types of special crops processing (97%).

- Nine out of ten processors (91%) clean special crops.
- Almost half (48%) of all processing is cleaning.

- Three-quarters of processors (76%) bulk load special crops.
- More than a quarter (28%) of all processing is bulk loading.

- More than 7 out of 10 processors (73%) bag special crops.
- One-fifth (20%) of all processing is bagging.

The average total volumes processed by each firm are substantial:

- The average annual cleaning volume is 14,812 tonnes.
- The average annual bulk loading volume is 10,411 tonnes.
- The average annual bagging volume is 7,782 tonnes.

There is considerable specialization among processors in the secondary processing activities.

- Seed splitting represents only 1.5% of all processing, but the average volume per firm is large at 9,765 tonnes per year.
- Colour sorting accounts for only 0.5% of all processing, but the average volume per firm is 2,524 tonnes per year.
- Feed processing accounts for only 0.5% of all processing, but the average volume is 1,947 tonnes per year.

Figure 9 summarizes processing activities.

FIGURE 9: Value-added Activities and Volumes

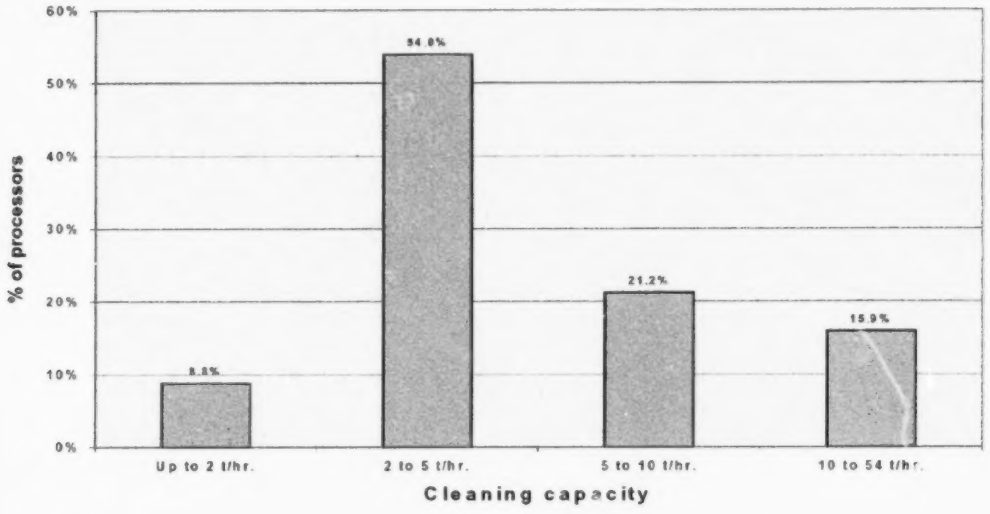
Value-added activity	% of all processors	Average volume (tonnes/year)	Total volume (tonnes/year)	% of total volume
Cleaning	90.7%	14,812	1,723,818	48.4%
Bulk loading	76.3%	10,411	1,010,526	28.4%
Bagging	72.9%	7,782	725,102	20.4%
Feed processing	7.6%	1,947	17,525	0.5%
Colour sorting	5.9%	2,524	17,669	0.5%
Splitting	4.2%	9,765	48,823	1.5%
Retail packaging	1.7%	231	463	0.0%
Milling	1.7%	163	325	0.0%
Other	3.4%	2,025	8,100	0.2%
Total (imputed)			3,550,000	100.0%

5.4.2 Cleaning Capacity

The minimum cleaning capacity of processors' plants is 1.1 t/hr. and the maximum cleaning capacity is 54 t/hr. The average cleaning capacity of **6.7 t/hr.** exceeds the median capacity of 4.5 t/hr by a large margin. This is a reflection of the fact that, while the large majority (63%) of plants is of small to medium size (i.e. up to 5 t/hr. capacity), a significant proportion (16%) has very large capacities ranging from 10 to 54 t/hr. The sector's cleaning capacity is weighted toward large-scale operations.

The distribution of processors by cleaning capacity is given in Figure 10.

FIGURE 10: Processors' Cleaning Capacity



5.4.3 Marketing of Special Crops

The characterization of sector firms as well-established with on-going, non-seasonal marketing commitments is consistent with the fact that a large proportion of processors is involved in purchasing and export of special crops.

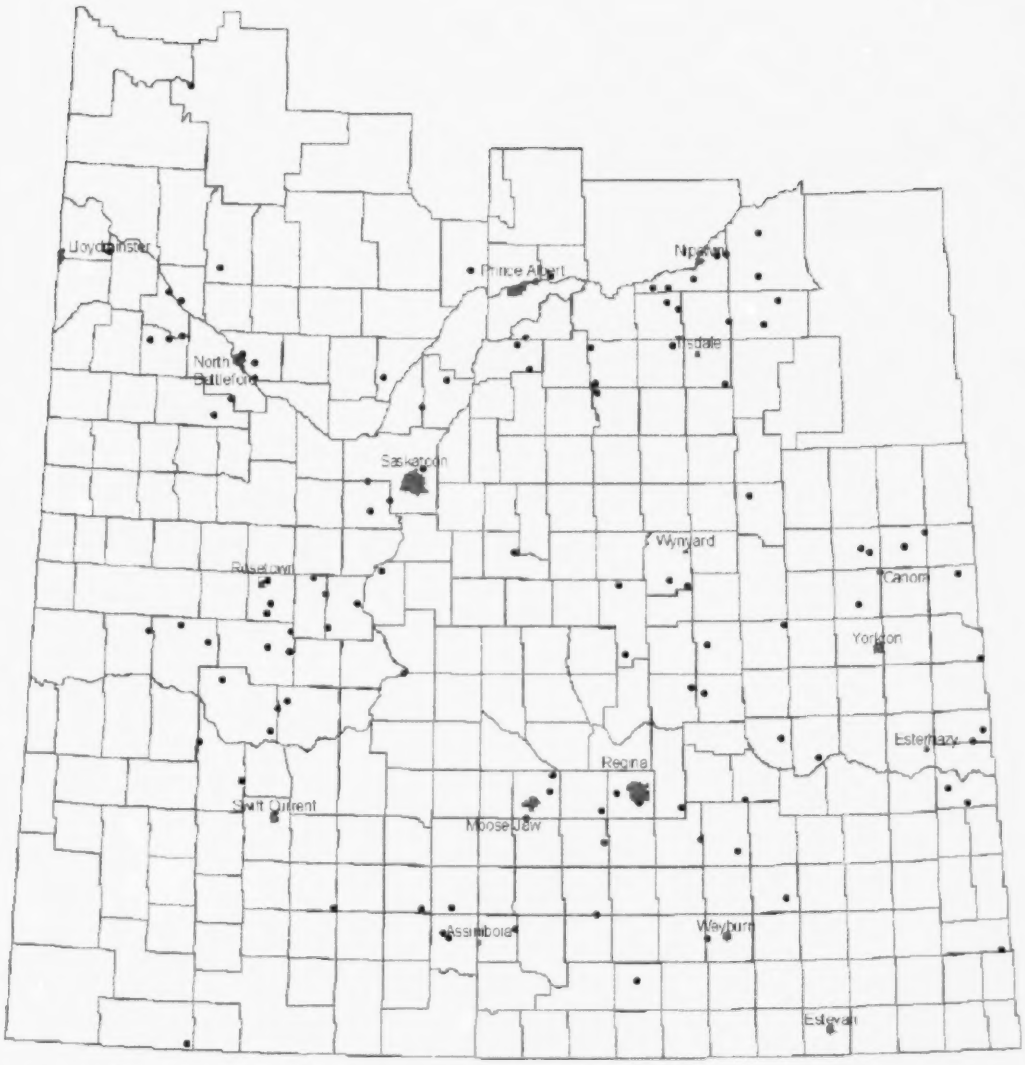
- Nearly half of processors (47%) purchase special crops.
- Nearly half of processors (48%) export special crops.

5.5 Geographical Distribution

While special crops processors are distributed throughout much of the province, there are fewer in the southern part, especially in the livestock-producing region in the southwest. To some extent processors tend to be located along river systems, particularly the North and South Saskatchewan Rivers, a phenomenon that may be related to the location of suitable production conditions or major trading centers.

Figure 11 shows the geographical distribution of special crops processors. Note that the position of each processor is not exact; it shows only that the location is within the rural municipality, not where within the municipality. As well, fifteen of the current processors did not report a rural municipality number, so are not shown on the map.

FIGURE 11: Geographical Distribution of Special Crops Processors



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